



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,788	09/26/2001	Setsuo Kobayashi	1113.40340X00	8825

20457 7590 07/30/2003

ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-9889

EXAMINER

RUDE, TIMOTHY L

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/889,788

Applicant(s)

KOBAYASHI ET AL.

Examiner

Timothy L Rude

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15. 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

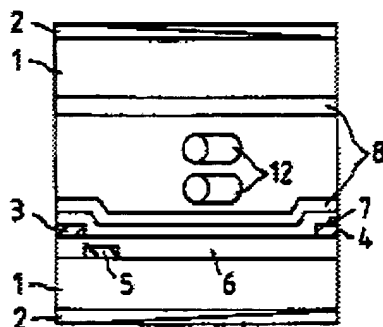
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 7-9, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe et al (Ohe '464) USPAT 5,600,464 in view of Ota et al (Ota) USPAT 5,831,707.

As to claims 1, 7, 9, and 14-15, Ohe '464 discloses in Figures 1-6, a liquid crystal display device comprising a pair of substrates and a liquid crystal layer held between the pair of substrates (Summary of the Invention, col. 1, line 45 through col. 3, line 63), at least one of the pair of substrates being provided with plural electrodes, 3 & 4, for applying a lateral electric field to the liquid crystal layer (col. 1, lines 56 and 57); an insulating film, 7 (Applicant's protection films), wherein the film thickness of the

Art Unit: 2871

protecting film is in the range of  $0.4\ \mu\text{m}$  to  $2\ \mu\text{m}$  (col. 3, lines 32-35), and oriented films, 8, formed on both of the pair of substrates (col. 1, lines 58-62); wherein "residual image is substantially eliminated" (col. 1, lines 46-50) to the point where "no visible residual image was observed at all" (col. 9, lines 40-45) (Applicant's an AC residual image of the oriented films is less than 8%).

*FIG. 1(a)*

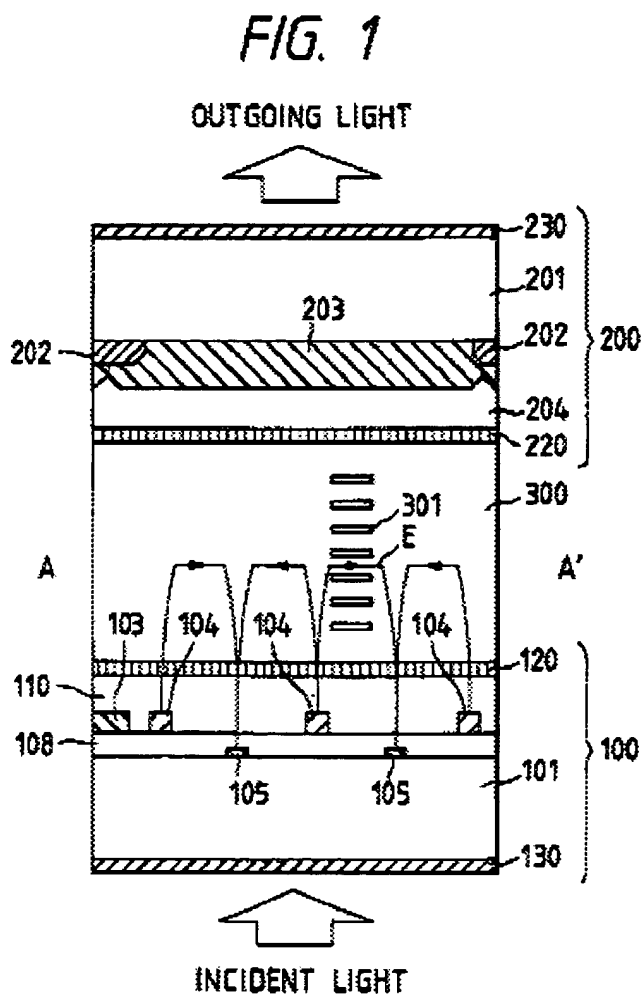
The invention of Ohe '464 deals primarily with the improved insulating and alignment layers to reduce residual image, and the values of Ohe '464 overlap the claimed ranges.

Ohe '464 does not explicitly disclose that the residual image which is substantially eliminated (Applicant's less than 8%) occurs even in a case of driving by pure AC.

Ota teaches that in an in-plane switch LCD the use of AC driving (Applicant's driving by pure AC) reduces the residual image relative direct current operation (col. 9, lines 54-65) to achieve a display having preferable quality. Note that Ota confirms the AC residual image would be less than the unspecified (AC or DC) residual image that

Art Unit: 2871

has already been made virtually zero by Ohe '464, therefore the combination meets Applicant's claimed range of less than 8%.



Ota is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add driving by pure AC to achieve a display having preferable quality.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 with the driving by pure AC of Ota to achieve a display having preferable quality.

As to claims 2, 8, and 16, Ohe '464 discloses (col. 2, lines 60-63) the use of a specific resistance of the liquid crystal layer of  $1 \times 10^9$  to  $8 \times 10^{15} \Omega\text{-cm}$  (overlaps Applicant's  $10^{10} \Omega\text{-cm}$  or more, establishes *prima facie* obviousness). Optimization of a results effective variable requires only ordinary skill in the art.

3. Claims 3, 10, and 17, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe '464 in view of Ota, as applied to claims above, and further in view of Mishina et al (Mishina) USPAT 5,350,539.

As to claims 3, 10, and 17, Ohe '464 in view of Ota discloses the liquid crystal display device according to claims 1, 7, and 15.

Ohe '464 in view of Ota does not explicitly disclose a device wherein at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount.

Mishina teaches the use of at least 10 mol % (overlaps Applicant's 5% and at most 30%) of an alkyl group (col. 2, line 44 through col. 3, line 23) to provide low temperature heat treatment and stable alignment properties (col. 1, lines 5-9). Mishina also teaches that the alkyl group may be a long-chain alkyl group in order to raise the tilt angle (col. 5, lines 23-25).

Mishina is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add 5% ~ 30% long-chain alkyl group to raise the tilt angle while providing low temperature heat treatment and stable alignment properties.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 in view of Ota with the add 5% ~ 30% long-chain alkyl group of Mishina to raise the tilt angle while providing low temperature heat treatment and stable alignment properties.

4. Claims 4, 5, 6, 11-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe '464 and Ota in view of Mishina as applied to claim 3 above, and further in view of Yu et al (Yu) USPAT 6,066,696.

As to claims 4, 5, 6, 11-13, and 18-20, Ohe '464 and Ota in view of Mishina disclose the liquid crystal display device according to claims 1, 3, 7, 10, 15, and 17.

Ohe '464 and Ota in view of Mishina do not explicitly disclose a device, wherein a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000.

Yu teaches the use of 1% to 20% (by weight, col. 5, lines 14-21) of a polyimide having an alkyl group at both ends (Applicant's terminal type) (col. 2, lines 32-60) with a molecular weight of  $5 \times 10^3$  to  $5 \times 10^5$  (col. 5, lines 21-28) (overlaps Applicant's 2,000 and at most 30,000) for improved optical alignment and thermal stability (col. 5, lines 19-21).

Yu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a polyimide having an alkyl group with a molecular weight of 2,000 and at most 30,000 for improved optical alignment and thermal stability.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Ohe '464 and Ota in view of Mishina with a polyimide having an alkyl group with a molecular weight of 2,000 and at most 30,000 of Yu for improved optical alignment and thermal stability.



***Response to Arguments***

5. Applicant's arguments filed on 18 June 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Regarding claims 1-1, 7-9, and 14-16, the claimed features are not disclosed or suggested anywhere by any combination of the references of record.

(2) Ohe '994 does not qualify as prior art.

(3) Independent claims 1, 7, and 14 claim a residual image of less than 8% in the case where the driving voltage is pure AC which is not disclosed by the prior art.

(4) A DC residual image is not related to the claimed application of pure AC.

(5) Regarding claims 2, 8, and 16, the claimed specific resistance of the liquid crystal layer is not described or suggested by Ohe or Ota, even in combination with other references.

(6) Regarding claims 3, 10, and 17, Ohe or Ota even in combination with other references do not disclose the claimed "at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount."

Art Unit: 2871

(7) Regarding claims 4, 11, and 18, Ohe or Ota even in combination with other references do not disclose the claimed “a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000.”

(8) Regarding claims 5-6, 12-13, and 19-20, Ohe or Ota even in combination with other references do not disclose the claimed polymer of a “long-chain alkylene group of at least one of a main chain type and a terminal type.”

(9) If anything, Ota teaches away from Applicant’s discovery of the phenomenon that residual image can be generated even in “pure AC”.

Examiner’s responses to Applicant’s ONLY arguments are as follows:

(1) Regarding claims 1-1, 7-9, and 14-16, It is respectfully pointed out that the claimed features are disclosed and/or suggested by the combinations of the references applied in the rejections above.

(2) Regarding Ohe ‘994 does not qualify as prior art, Applicant’s argument is persuasive, finality is withdrawn, and this Non-Final Rejection applies Ohe ‘464 which is prior art.

(3) It is respectfully pointed out that the unspecified (AC or DC) residual image of Ohe ‘464 is “substantially eliminated” to be “no residual image at all” per rejections above, and that the AC residual image is less than the DC residual image as a matter of physics as is evidenced by Ota, per rejections above. Therefore, the DC residual image

Art Unit: 2871

of the device of Ohe '464 is a more stringent constraint on reducing the residual image than is Applicant's claimed AC residual image. Consequently, Ohe '464 meets the claimed limitations of a residual image of less than 8% in the case where the driving voltage is pure AC as is evidenced by Ota.

(4) It is respectfully pointed out that Ota teaches that the DC residual image is related to the claimed application of pure AC, in that the DC residual image is larger, per rejections above.

(5) Regarding claims 2, 8, and 16, the claimed specific resistance of the liquid crystal layer is disclosed by Ohe '464, per rejections above.

(6) Regarding claims 3, 10, and 17, it is respectfully pointed out that Mishina is applied to teach "at least one of the oriented films is an organic polymer containing at least one of a polymer and an oligomer in which a weight substance with a long-chain alkyl group applied to an amine component or an acid sentence is at least 5% and at most 30% of the total molar amount", per rejections above.

(7) Regarding claims 4, 11, and 18, it is respectfully pointed out that Yu is applied to teach "a weight average molecular weight of the polymer and the oligomer is at least 2,000, and at most 30,000" for improved optical alignment and thermal stability, per rejections above.

(8) Regarding claims 5, 12, and 19, it is respectfully pointed out that Yu is applied to teach the use of 1% to 20% (by weight, col. 5, lines 14-21) of a polyimide having an alkyl group at both ends (Applicant's terminal type) (col. 2, lines 32-60) with a molecular weight of  $5 \times 10^3$  to  $5 \times 10^5$  (col. 5, lines 21-28) (overlaps Applicant's 2,000

Art Unit: 2871

and at most 30,000) for improved optical alignment and thermal stability (col. 5, lines 19-21), per rejections above.

(9) It is respectfully pointed out that Ota teaches residual image is reduced by driving with AC vs DC. This does not teach away from Applicant's discovery of the phenomenon that some residual image can still remain even when driving with "pure AC". Furthermore, residual image is not a goal. Minimization or preferably elimination of residual image is the goal. Discovery of something undesirable, and how to create something undesirable, is generally not of value. Prior art teaches a device wherein "residual image is substantially eliminated" (col. 1, lines 46-50) to the point where "no visible residual image was observed at all" (col. 9, lines 40-45) which meets Applicant's claimed range of less than 8%, per rejections above.

### ***Conclusion***

Applicant's amendment filed 03 January 2003 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

Art Unit: 2871

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

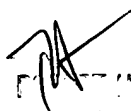
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude  
Examiner  
Art Unit 2871

TLR  
July 23, 2003



ROBERT H KIM  
SUPERVISOR  
JUL 23 2003